

PCT/CA 2004/002052
29 November 2004

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United States Patent and Trademark Office

October 12, 2004

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE UNDER 35 USC 111.

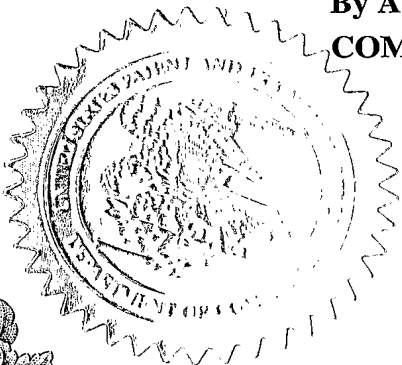
APPLICATION NUMBER: 10/722,399

FILING DATE: November 28, 2003

PRIORITY DOCUMENT

SUBMITTED OR TRANSMITTED IN
COMPLIANCE WITH RULE 17.1(a) OR (b)

**By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS**



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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.

14537

First Inventor

JACKSON, Reinhard E

Title

Portable Canoe Propulsion

Express Mail Label No.

22878

10722399



APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO:

 Mail Stop Patent Application
 Commissioner for Patents
 P.O. Box 1450
 Alexandria VA 22313-1450

1. ☒ Fee Transmittal Form (e.g., PTO/SB/17)
(Submit an original and a duplicate for fee processing)
2. ☒ Applicant claims small entity status.
See 37 CFR 1.27.
3. ☒ Specification [Total Pages 10]
(preferred arrangement set forth below)
 - Descriptive title of the invention
 - Cross Reference to Related Applications
 - Statement Regarding Fed sponsored R & D
 - Reference to sequence listing, a table, or a computer program listing appendix
 - Background of the invention
 - Brief Summary of the invention
 - Brief Description of the Drawings (if filed)
 - Detailed Description
 - Claim(s)
 - Abstract of the Disclosure
4. ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets 7]
5. Oath or Declaration [Total Sheets 2]
 - a. ☒ Newly executed (original or copy)
 - b. ☐ Copy from a prior application (37 CFR 1.63(d))
(for continuation/divisional with Box 18 completed)
 - i. ☐ **DELETION OF INVENTOR(S)**
Signed statement attached deleting inventor(s) name in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
6. ☐ Application Data Sheet. See 37 CFR 1.76

7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix)
8. Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary)
 - a. ☐ Computer Readable Form (CRF)
 - b. Specification Sequence Listing on:
 - i. ☐ CD-ROM or CD-R (2 copies); or
 - ii. ☐ Paper
 - c. ☐ Statements verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

9. ☐ Assignment Papers (cover sheet & document(s))
10. ☐ 37 CFR 3.73(b) Statement (when there is an assignee) ☒ Power of Attorney
11. ☐ English Translation Document (if applicable)
12. ☒ Information Disclosure Statement (IDS)/PTO-1449 ☒ Copies of IDS Citations
13. ☐ Preliminary Amendment
14. ☒ Return Receipt Postcard (MPEP 503) (Should be specifically itemized)
15. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed)
16. ☐ Nonpublication Request under 35 U.S.C. 122 (b)(2)(B)(i). Applicant must attach form PTO/SB/35 or its equivalent.
17. ☐ Other:

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.:

Prior application information: Examiner _____ Art Unit: _____
 For CONTINUATION OF DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

19. CORRESPONDENCE ADDRESS

☒ Customer Number: 000293 OR ☐ Correspondence address below

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		Fax	703-415-2559
Name (Print/Type)	Ralph A. Dowell	Registration No. (Attorney/Agent)	26,868
Signature		Date	11-28-03

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13281
U.S. PTO

PTO/SB/17 (10-03)

Approved for use through 07/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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FEE TRANSMITTAL for FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision.

☒ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$)
385.00

Complete if Known

Application Number
Filing Date
First Named Inventor JACKSON, Reinhard E.
Examiner Name
Art Unit
Attorney Docket No. 14537

METHOD OF PAYMENT (check all that apply)

☒ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

☒ Deposit Account:

Deposit Account Number 04-1577 deficiencies only
Deposit Account Name

The Director is authorized to: (check all that apply)

☒ Charge fee(s) indicated below ☒ Credit any overpayments
☒ Charge any additional fee(s) or any underpayment of fee(s)
☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
1001 770	2001 385	Utility filing fee	385.00
1002 340	2002 170	Design filing fee	
1003 530	2003 265	Plant filing fee	
1004 770	2004 385	Reissue filing fee	
1005 160	2005 80	Provisional filing fee	
SUBTOTAL (1)			(\$) 385.00

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Total Claims 14 -20** = 6 X Fee from below =
Independent Claims 1 -3** = 0 X =
Multiple Dependent

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
1202 18	2202 9	Claims in excess of 20	
1201 86	2201 43	Independent claims in excess of 3	
1203 290	2203 145	Multiple dependent claim, if not paid	
1204 86	2204 43	** Reissue independent claims over original patent	
1205 18	2205 9	** Reissue claims in excess of 20 and over original patent	
SUBTOTAL (2)			(\$) 0

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Small Entity

Fee Code (\$)	Fee Code (\$)	Fee Description	Fee Paid
1051 130	2051 65	Surcharge - late filing fee or oath	
1052 50	2052 25	Surcharge - late provisional filing fee or cover sheet	
1053 130	1053 130	Non-English specification	
1812 2,520	1812 2,520	For filing a request for ex parte reexamination	
1804 920*	1804 920*	Requesting publication of SIR prior to Examiner action	
1805 1,840*	1805 1,840*	Requesting publication of SIR after Examiner action	
1251 110	2251 55	Extension for reply within first month	
1252 420	2252 210	Extension for reply within second month	
1253 950	2253 475	Extension for reply within third month	
1254 1,480	2254 740	Extension for reply within fourth month	
1255 2,010	2255 1,005	Extension for reply within fifth month	
1401 330	2401 165	Notice of Appeal	
1402 330	2402 165	Filing a brief in support of an appeal	
1403 290	2403 145	Request for oral hearing	
1451 1,510	1451 1,510	Petition to institute a public use proceeding	
1452 110	2452 55	Petition to revive - unavoidable	
1453 1,330	2453 665	Petition to revive - unintentional	
1501 1,330	2501 665	Utility issue fee (or reissue)	
1502 480	2502 240	Design issue fee	
1503 640	2503 320	Plant issue fee	
1460 130	1460 130	Petitions to the Commissioner	
1807 50	1807 50	Processing fee under 37 CFR 1.17(q)	
1806 180	1806 180	Submission of Information Disclosure Stmt	
8021 40	8021 40	Recording each patent assignment per property (times number of properties)	
1809 770	2809 385	Filing a submission after final rejection (37 CFR 1.129(a))	
1810 770	2810 385	For each additional invention to be examined (37 CFR 1.129(b))	
1801 770	2801 385	Request for Continued Examination (RCE)	
1802 900	1802 900	Request for expedited examination of a design application	

Other fee (specify)

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$)
0

SUBMITTED BY

Name (Print/Type) Ralph A. Dowell
Registration No. (Attorney/Agent) 26,868
Telephone 703-415-2555
Signature Date 11-28-03

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PORTABLE CANOE PROPULSION SYSTEM

Field of Invention

This invention relates to a portable propulsion device for use in a small watercraft such as a canoe. More particularly, this invention relates a portable pedal and seat device for driving an outboard propeller pivotally mounted alongside the canoe for movement between an operative position wherein the propeller is in the water and an inoperative position wherein the propeller is out of the water and the propeller drive shaft is in a plane parallel the gunwhale of the canoe.

Background of Invention

Pedal operated watercraft, such as canoes, are well known in the art and there are numerous patents directed to specific features thereof. Such devices generally comprise a frame structure, with or without a seat, having a pedal crank and sprocket system connected, by way of a chain, to a drive shaft which drives, via a series of gears and pinions, a vertically mounted drive shaft at the stern of the watercraft which in turn drives a propeller mounted on a horizontal axis. Such devices are relatively complex and involve a long gear train which is inherently expensive. The rigidly mounted vertical shaft at the stern to drive the propeller implies that the propeller is at a fixed depth relative to the keel of the watercraft, and it is difficult, if not impossible, for a canoeist to turn around in a relatively unstable canoe to reach the vertically mounted drive shaft at the stern so as to raise the propeller out of the water when not in use or in shallow water. There is a need, therefore, for a simple pedal operated propulsion system in which the propeller can be raised or lowered easily by the canoeist without moving from

his seat or even turning to face the rear of the canoe. Preferably, the canoeist should be seated as low as possible in the canoe for stability reasons and the pedal device should incorporate both the seat and the crank mechanism and should be simply placed across the gunwhales of the canoe without needing clamps, bolts or other devices to secure it in place.

Object of invention.

It is an object of the present invention to provide a portable crank-operated, propeller driven, propulsion system for use in a canoe or other small watercraft, in which the propeller is mounted on a propeller shaft which can be raised to, or lowered from, a substantially horizontal position parallel to the gunwhale of the canoe to an operative position in which the propeller shaft is at an acute angle relative to the gunwhale and the propeller is at any selected depth in the water.

Brief Statement of Invention.

By one aspect of this invention there is provided a portable, pedal driven propulsion device, for use in a watercraft having gunwhales, comprising:

- (a) a substantially quadrilateral frame adapted to be releasably mounted on the gunwhales of said watercraft;
- (b) operator seat means mounted on said quadrilateral frame;
- (c) pedal crank means mounted forwardly of, and depending from, said quadrilateral frame and operable by an operator sitting on said seat means;
- (d) a gear box pivotally mounted, on said quadrilateral frame so as to lie outboard of one of said gunwhales and forward of said operator seat means when in

operative position;

- (e) means to transmit motive power generated by said pedal crank means to said gear box; and
- (f) longitudinal drive shaft means operatively connected at one end thereof to said gear box and, at a second end thereof, to a propeller means;

said gear box and drive shaft means being adapted to be pivoted, when mounted on said watercraft, about a horizontal transverse axis so as to raise said propeller means to an inoperable position wherein said drive shaft means is substantially parallel to said one gunwhale, and lower said propeller means to an operative position wherein said drive shaft means is at an acute angle relative to said gunwhale.

Brief Description of Drawings.

Fig. 1 is an isometric side view of one embodiment of the present invention, mounted on a canoe;

Fig. 2 is an oblique isometric front view of the embodiment of Fig. 1;

Fig. 3 is an oblique isometric rear view of the embodiment of Fig. 1;

Fig. 4 is a side view, partly in section, of the embodiment of Fig. 1;

Fig. 5 is a plan view of the embodiment of Fig. 1;

Fig. 6 is a front view of the embodiment of Fig. 1;

Fig. 7 is an enlarged detail view of the drive shaft shown in Fig. 6 in the engaged position; and

Fig. 8 is an enlarged detail view of the drive shaft shown in Fig. 6, in the

disengaged position.

Detailed Description of Preferred Embodiments.

In Fig. 1 there is shown an isometric side view of one embodiment of the present invention with the drive shaft 2 in the angled, or lowered, position along the side of the canoe 1 upon which the device has been placed and rests on the gunwhales thereof. As seen most clearly in Fig. 5, a quadrilateral frame comprising a pair of parallel, longitudinally extending, tubular members 11,12 and a pair of parallel, transversely extending members 13,14, rests on the gunwhales 15,16 of canoe 1, immediately behind the central thwart 17 thereof and supports seat 4, preferably but not essentially adjustably, therebetween. It has been found that clamps, bolts or the like are not required to secure the frame to the canoe, but preferably the ends of transverse members are covered with a non-slip material, such as rubber, to provide additional grip and to reduce slippage. As seen in Fig. 1, a canoe operator 3, seated on seat 4 propels the canoe 1 by means of pedals 5 and cranks 6, mounted on a tubular member 18 forwardly of the quadrilateral frame on the longitudinal centre line and near the bottom of the canoe. Pedals 5 and cranks 6 are operatively mounted on toothed sprocket 7 which drives endless chain 8. Chain 8 is operatively connected to rear sprocket 9, mounted for rotation about a horizontal transverse axis on a lower transverse drive shaft 10, contained within drive tube 19 which is supported by a tubular member 20 depending from transverse tubular member 13. The outer end of shaft 10 is supported by bearing 21 and terminates in a sprocket 22 to drive endless chain 23 and sprocket 24. Sprocket 24 is mounted to one end of a transvers drive shaft 25 which in turn is

rotatably mounted in bearing 26 on transverse member 13 at a level slightly above gunwhale 16. The outboard end of shaft 25 is provided with a hub 27 having a hexagonal axial bore 28 therein. A spring loaded hexagonal shaft 29 is slideably mounted in an axial bore of a drive shaft 30 so that an end 31 of shaft 29 can releasably engage in bore 28, as seen in Fig. 7. Shaft 30 is rotatably mounted within a tubular housing 31 and axially moveable so as to disengage shaft 29 when required and to align spring-loaded shaft 29 with bore 28 so as to engage therewith, one end of which supports bearing 26 and the other end of which rotatably supports gear box housing 32. A bevel gear 33, contained within housing 32, is splined to a shaft 34, rotatably supported by bearing 35, which is in turn axially splined to shaft 30. Bevel gear 33 operatively engages bevel gear 34, also contained within housing 32, axially mounted on a propeller drive shaft 35 which is supported by bearings 36,37 within housing 32 and contained within a tubular casing 38. A cutlass bearing 39 is provided at the lower end of housing 38 to support shaft 35 adjacent a propeller 40. It will be appreciated that shaft 35 and tubular casing 38 can be moved in a vertical plane by rotating gear box housing 32 about a horizontal transverse axis provided by housing 31, so that shaft 35 can be raised to a horizontal, inoperative, position parallel the gunwhale 16 in which propeller 40 is raised out of the water, and lowered to an angled, operative, position as seen in Fig.4, in which the propeller 40 is below the water level. Preferably, housing 38 is supported, intermediate the ends thereof by either a hanger 41 adjustably suspended from transverse member 14 or a pair of hangers 41, 42 suspended from transverse member 14, so as to retain housing 38 in the operative position or the inoperative

position as selected by the operator simply by reaching over the side of the canoe and without needing to turn or reach towards the stern of the canoe.

As seen in Figs. 2,3, 4 and 5, longitudinal member 12 is somewhat longer than longitudinal member 11 and is angled outwardly towards the stern to support a rudder post housing 43, vertical rudder post 44 and rudder 45. A control arm 46 is mounted on rudder post 44, perpendicular to rudder 45, and pivotally mounted to a control rod or tiller 47 for operation by operator 3 to steer the canoe. Preferably , but not essentially, rudder 45 is axially aligned with propeller 40.

It will be appreciated that many modifications may be made without departing from the spirit and scope of this invention as defined by the appended claims. For example, the conventional toothed sprockets 7,9,22 and 24 may, if desired be replaced with similarly conventional smooth pulley wheels with associated ribbed or plain rubber drive belts.

I CLAIM.

1. A portable, pedal driven propulsion device, for use in a watercraft having gunwhales, comprising:

- (a) a substantially quadrilateral frame adapted to be releasably mounted on the gunwhales of said watercraft;
- (b) operator seat means mounted on said quadrilateral frame;
- (c) pedal crank means mounted forwardly of, and depending from, said quadrilateral frame and operable by an operator sitting on said seat means;
- (d) a gear box pivotally mounted, on said quadrilateral frame so as to lie outboard of one of said gunwhales and forward of said operator seat means when in operative position;
- (e) means to transmit motive power generated by said pedal crank means to said gear box; and
- (f) longitudinal drive shaft means operatively connected at one end thereof to said gear box and, at a second end thereof, to a propeller means;

said gear box and longitudinal drive shaft means being adapted to be pivoted, when mounted on said watercraft, about a horizontal transverse axis so as to raise said propeller means to an inoperable position wherein said drive shaft means is substantially parallel to said one gunwhale, and lower said propeller means to an operative position wherein said drive shaft means is at an acute angle relative to said gunwhale.

2. A propulsion device as claimed in claim 1, wherein said drive shaft is rotatably mounted within a longitudinal tube means.
3. A propulsion device as claimed in claim 2, including means to support said tube means, intermediate the ends thereof, in a selected one of said operative and inoperative positions.
4. A propulsion device as claimed in claim 2 wherein said means to transmit power comprises first drive means operatively connected to a first end of a first transverse drive shaft, second drive means operatively connected to a second end of said first transverse drive shaft, a second transverse drive shaft means operatively connected to said second drive means at a first end thereof and to said gear box at a second end thereof.
5. A propulsion device as claimed in claim 4 wherein said second transverse drive shaft means includes slideable means to selectively engage and disengage said second chain drive means and said gear box.
6. A propulsion device as claimed in claim 5 wherein said second transverse drive shaft means is rotatably mounted in transverse tube means mounted on said quadrilateral frame.
7. A propulsion device as claimed in claim 6 wherein said second transverse drive shaft means includes first bevel gear means at said second end thereof.
8. A propulsion device as claimed in claim 7 wherein said longitudinal drive shaft means includes second bevel gear means at said one end thereof.
9. A propulsion device as claimed in claim 8 wherein said first and second

bevel gear means are contained within said gear box and mounted at right angles to each other for meshing engagement.

10. A propulsion device as claimed in claim 9 when mounted on said watercraft.

11. A propulsion device as claimed in claim 10 wherein said watercraft is a canoe.

12. A propulsion device as claimed in claim 1 wherein said operator seat means is adjustably mounted on said quadrilateral frame.

13. A propulsion device as claimed in claim 1 wherein said operator seat means is rigidly mounted on said quadrilateral frame.

14. A propulsion device as claimed in claim 4 wherein said first and second drive means comprise chain drive means.

Abstract of Disclosure

A portable pedal driven propulsion device for a small watercraft in which power from crank operated pedals is transmitted to a pivotally mounted gearbox on the outside of the watercraft adjacent the operator. A longitudinal drive shaft is connected, at one end, to the gear box and, at the other end, to a propeller so that the drive shaft and propeller can be moved selectively between a raised inoperative position and a lowered operative position.

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DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

Declaration
Submitted
With Initial
Filing

OR

Declaration
Submitted after Initial
Filing (surcharge
(37 CFR 1.16 (e))
required)

Attorney Docket Number

14537

First Named Inventor

JACKSON, Reinhard E.

COMPLETE IF KNOWN

Application Number

Filing Date

Art Unit

Examiner Name

I hereby declare that:

Each inventor's residence, mailing address, and citizenship are as stated below next to their name.

I believe the inventor(s) named below to be the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

PORTABLE CANOE PROPULSION SYSTEM

(Title of the Invention)

the specification of which



is attached hereto

OR



was filed on (MM/DD/YYYY).

as United States Application Number or PCT International

Application Number

and was amended on (MM/DD/YYYY)

(if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				Yes	No
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

[Page 1 of 2]

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DECLARATION — Utility or Design Patent Application

Direct all correspondence to: <input checked="" type="checkbox"/>		Customer Number: 000293		OR <input checked="" type="checkbox"/>		Correspondence address below	
Name Dowell & Dowell							
Address Suite 309, 1215 Jefferson Davis Highway							
City Arlington,				State VA		ZIP 22202-3214	
Country U.S.A.			Telephone 703-415-2555		Fax 703-415-2559		
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.							
NAME OF SOLE OR FIRST INVENTOR:				<input type="checkbox"/> A petition has been filed for this unsigned inventor			
Given Name (first and middle [if any]) Reinhard Erwin				Family Name or Surname JACKSON			
Inventor's Signature <i>Reinhard Jackson</i>						Date 21.11.03	
Residence: City Bath		State ON		Country Canada		Citizenship Canadian	
Mailing Address 122, Nicholson's Point							
City RR#3, Bath		State ON		ZIP K0H 1G0		Country Canada	
NAME OF SECOND INVENTOR:				<input type="checkbox"/> A petition has been filed for this unsigned inventor			
Given Name (first and middle [if any])				Family Name or Surname			
Inventor's Signature						Date	
Residence: City		State		Country		Citizenship	
Mailing Address							
City		State		ZIP		Country	
<input type="checkbox"/> Additional inventors or a legal representative are being named on the _____ supplemental sheet(s) PTO/SB/02A or 02LR attached hereto.							

Please type a plus sign (+) inside this box → +

PTO/SB/81 (10-00)

Approved for use through 10/31/2002. OMB 0651-0035

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POWER OF ATTORNEY OR AUTHORIZATION OF AGENT

Application Number

Filing Date

First Named Inventor

JACKSON, Reinhard Erwin

Group Art Unit

Examiner Name

Attorney Docket Number

14537

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000293

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Ralph A. Dowell

Address

Suite 309

Address

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Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

SIGNATURE of Applicant or Assignee of Record

Name

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Signature

Reinhard Erwin Jackson

Date

21.11.03

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

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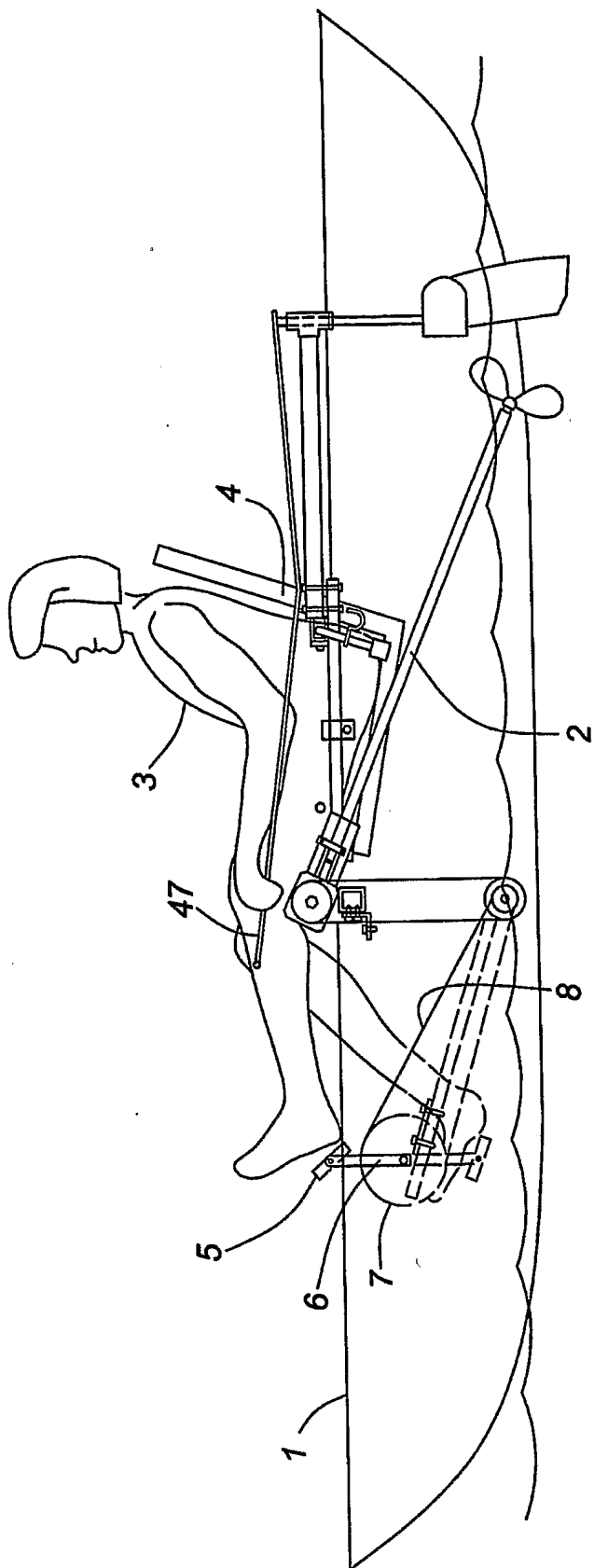


FIG. 1

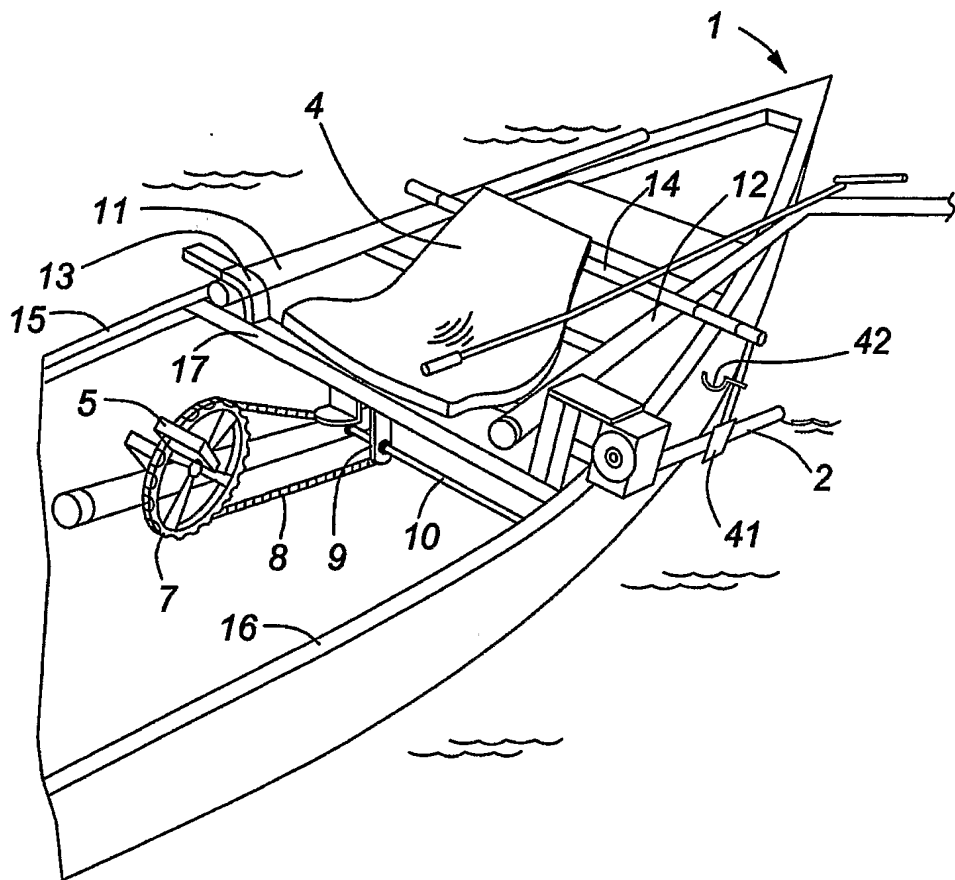


FIG. 2

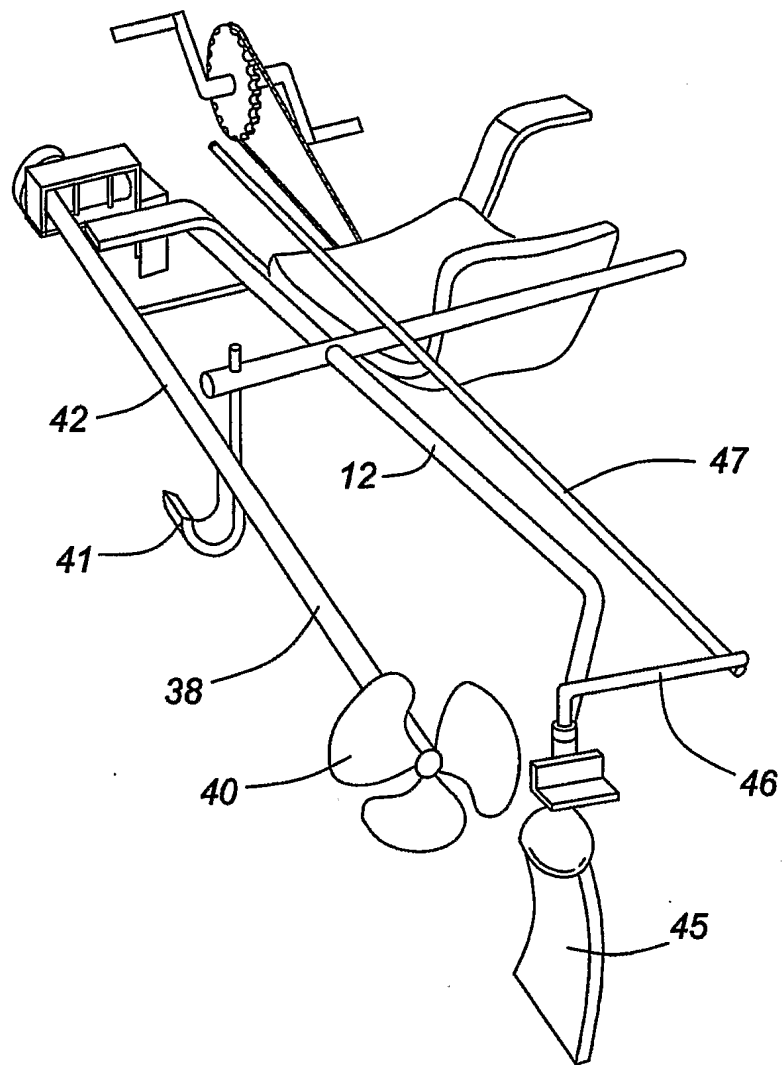


FIG. 3

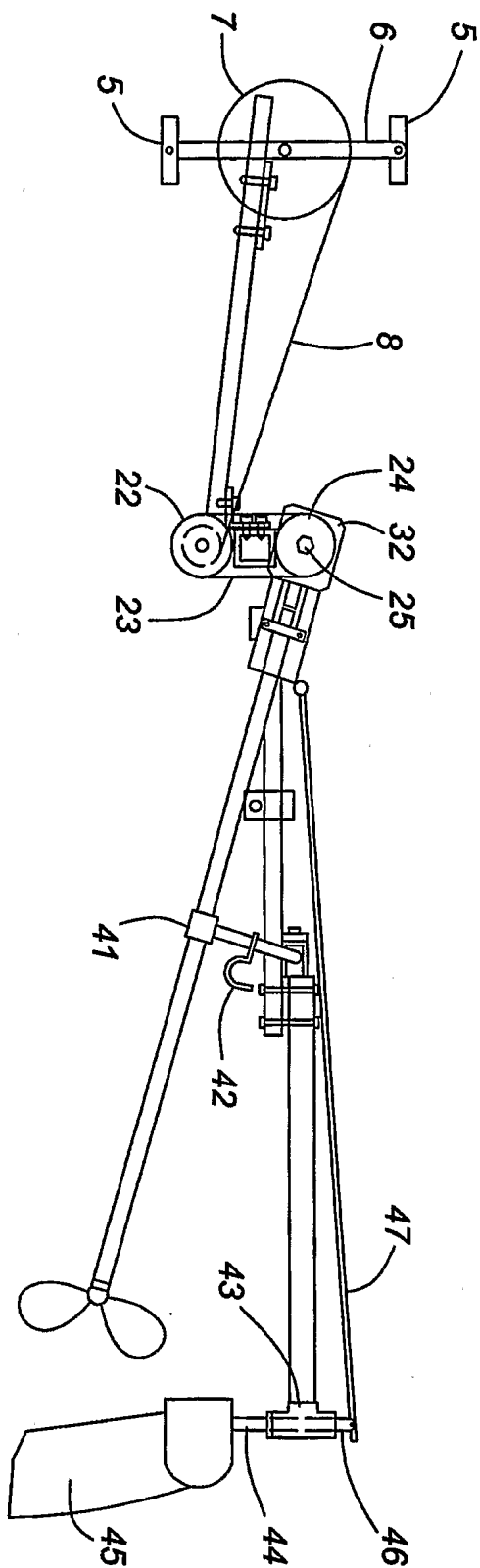


FIG. 4

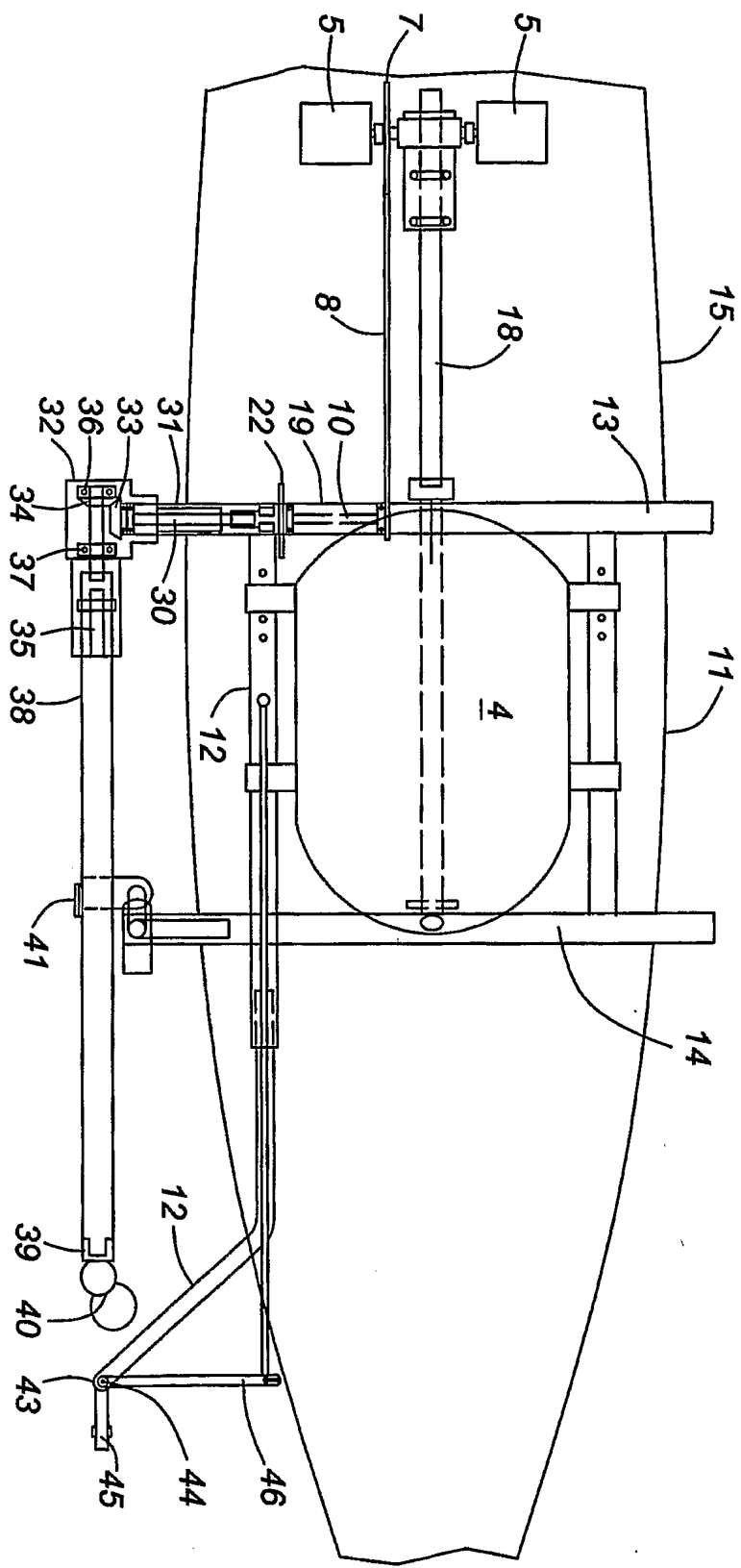


FIG. 5



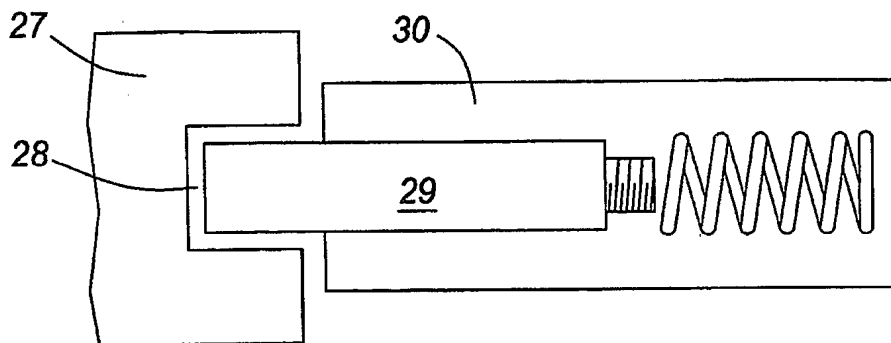


FIG. 7

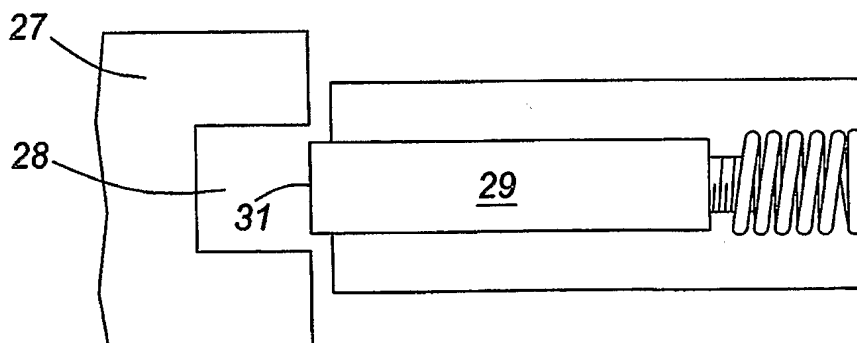


FIG. 8